THE MEDICAL EDUCATOR IN THE 21ST CENTURY: A PERSONAL PERSPECTIVE

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ABSTRACT

Academic faculty involved in medical education are set apart from educators in other fields by a different set of expectations and responsibilities. For a subgroup of such faculty, classified in this paper as clinician educators and educational leaders, their role as educators typically defines their primary academic contribution and mode of professional advancement. A variety of environmental factors, classified under the categories of changes in the healthcare system, changes in the educational environment, changes in the educational approach, and faculty pressures, present a series of challenges to these medical educators and to other teaching faculty at the beginning of the 21st century. Ten such factors are identified in this article, followed by a series of suggested approaches for addressing these environmental challenges.

Over the course of 30 years since my training in internal medicine with a subspecialty in pulmonary and critical care medicine, my career interests have evolved from the traditional academic medicine combination of clinical medicine, research, and teaching, to a more focused concentration on medical education. After progressively assuming more responsibilities for educational leadership at a medical school and large academic medical center, I eventually transitioned to my current role with a national organization whose mission includes furthering the cause of medical education in internal medicine at all levels of the educational continuum—from undergraduate to graduate to continuing medical education.

These different perspectives have afforded me a glimpse of the challenges that face medical educators early in the 21st century. After setting the stage by identifying some of the unique features of medical education and the medical educator, I will explore the varied environmental factors that underlie these current challenges. I will conclude by addressing how educators and the educational system can best

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adapt to confront these challenges in order to further our mission of providing the highest quality professional education to today's learners, who will become tomorrow's physicians.

How Does Medical Education Differ from Other Forms of Education?

Although any form of education could be considered unique in its own right based upon differences in content, medical education does have some distinctive features that set it apart from other forms of post-baccalaureate education. These features translate into responsibilities for the medical educator that go well beyond the mastery of the educational content or the ability to convey that content to learners. First, the medical educator in a clinical setting (i.e. the clinician educator) provides critical role modeling for the learner. Teaching occurs in the same setting in which care is provided, so the learner directly observes how the teacher puts words into action. How the faculty member acquires data, assesses, and interacts with patients; how (s)he applies general knowledge to the circumstances of a particular patient; and how (s)he displays compassion, empathy, and professionalism are all important components of the relationship between teacher and student. It is not just what the teacher says that is important, it is what the teacher actually does. Although one might argue that it is possible to teach professionalism in an abstract way, I would argue that there is no better way to teach professionalism than through the role modeling conveyed by a clinician who is masterful in both the art and the science of medicine.

A second distinctive feature of medical education is the variety of settings in which such teaching and learning occur. Although some medical educators only teach in a single setting, a substantial percentage of medical faculty teach in multiple formats and settings, including lectures, small group discussions, bedside teaching, and one-on-one supervision. Many fundamental teaching skills carry across from setting to setting, but others do not, and the variety of teaching abilities demonstrated by a versatile medical educator is often striking and quite remarkable.

Finally, a critical component of educating in a medical setting is direct supervision, accompanied by evaluation and feedback that are (or should be) provided on a frequent or even real-time basis. This is quite different from the typical end-of-course grade provided in most educational settings. Additionally, evaluation of the learner is based not just on knowledge and factual recall, but on assessment of the learner's ability to apply knowledge in the clinical setting and on interpersonal skills.

The Spectrum of Faculty in Medical Education

The various types of teaching involved in medical education are matched by a similar spectrum of faculty involvement in educational activities, although there is no direct linkage between a particular type of faculty member and the type(s) of teaching with which that faculty member is involved (lecture, small group, one-on-one, etc.). Table 1 summarizes many, though not all (since I have excluded pure researchers), of the "flavors" of faculty that populate academic medical centers and medical schools, categorized according to the relative prominence of various activities in their professional lives.

In contrast to the pure clinician who does not have any teaching responsibilities, the *clinician-teacher* typically adds teaching responsibilities to his or her professional portfolio, though clinical medicine generally predominates over that faculty member's teaching obligations. I believe it is worthwhile to use the term *clinician-educator* for a different category of faculty member than that described by the term clinician-teacher. The clinician-educator often has a more balanced portfolio of educational and clinical responsibilities, and those educational responsibilities typically form the basis of academic advancement for the faculty member. Over time, clinician-educators commonly assume positions of educational leadership, thus transitioning into the category of *educational leader*. Specific examples of leadership roles include direction of courses, clerkships, and training programs, or positions as an educational dean or as a director of education at a divisional or departmental level.

The traditional "triple threat," which has become a less common species in academic medicine than it was several decades ago, incorporates teaching alongside research activities and clinical responsibilities. Research productivity typically drives the process of academic advancement for triple threat faculty, although teaching contributions may also contribute to the credentials for academic advancement. The

TABLE 1
Common Academic Career Paths With Clinical and/or Teaching Responsibilities

	Clinical	Teaching	Research	Administration
Clinician	+++			
Clinician-Teacher	++	+		
Clinician-Educator	++	++	V	V
Educational Leader	V	++	V	++
"Triple Threat"	+	+	++	
"Quadruple Threat"	+	+	+	++

V = variable.

ultimate degree of academic diversity is found in the "quadruple threat," who adds a significant administrative role to an already difficult juggling act of teaching, research, and clinical responsibilities.

Although the challenges described in the rest of this paper can apply to any faculty member who has some teaching responsibilities, they are perhaps most applicable to two of the just-described categories—the clinician educator and the educational leader—whose academic contributions are primarily defined by their teaching roles.

Environmental Issues for the 21st Century Medical Educator

A variety of environmental factors underlie the challenges for today's medical educators. I will describe what I consider to be the "top 10" factors, each of which seems to reside within one of four broad categories. The categories and the individual items in each category are summarized in Table 2.

The first category includes *changes in the healthcare system.* Over the past decade, there has been an increasing focus on patient safety and on gaps in the quality of care that patients receive in the American healthcare system [1–3]. A burgeoning literature about our deficiencies in patient care has led to a variety of pay-for-performance initiatives aimed at improving the value that patients receive for their healthcare dollar [4–6]. This appropriate priority on the quality of care has fueled a

TABLE 2
The "Top 10" Environmental Issues for the 21st Century Medical Educator

Category of Challenge	Specific Challenge
Changes in the healthcare system	Focus on quality of care (including patient safety)
Changes in the healthcare system	Focus on teams and team-based care
Changes in the educational environment	A challenged inpatient environment for learning
Changes in the educational environment	Housestaff duty hours
Changes in the educational approach	Shift from pathophysiology-based model to evidence-based model
Changes in the educational approach	Focus on competency-based educational outcomes
Changes in the educational approach	The digital age of education
Faculty pressures	Remuneration model based on clinical and research productivity
Faculty pressures	Time pressure
Faculty pressures	Need to learn new, non-traditional skills

similar interest in residency programs for trainees to evaluate, reflect upon, and improve the quality of their care [7]. One of the six general competencies outlined by the Accreditation Council for Graduate Medical Education (ACGME) is practice-based learning and improvement, specifically directed at developing a culture of quality improvement that ideally will persist throughout a physician's career [8].

Another change in the healthcare system is the focus on teams and team-based care. This emphasis is at the center of the chronic care model, developed by Dr. Edward Wagner and others as an idealized though achievable model for providing longitudinal care to patients with chronic, complex medical problems [9, 10]. Similarly, the patient-centered medical home, a model which has recently been espoused for its value in providing primary or principal care to patients, is built around a foundation of team-based care [11]. As is the case for quality improvement, the ACGME has defined a general competency of systems-based practice, through which residents are expected to understand systems of care and practice effectively in teams.

The second category includes *changes in the educational environment.* For a number of years, the inpatient environment, which has been the primary setting for resident training, has progressively become challenged as an educational locale. Pressure on residents to increase "throughput" and get patients out of the hospital quickly has led to early and excessive use of consultants and over-reliance on attending physicians' directions, rather than on residents' assuming personal responsibility for independent decision-making. Students and residents also see a skewed population of patients—those who are most critically ill, often with diagnoses and treatment plans well established before hospitalization. The trainee therefore becomes more of a secondary player in patient care, having lost the opportunity to establish a diagnosis and develop a well-reasoned treatment plan. Furthermore, increasing emphasis on documentation has led to less personal involvement of residents with their patients, as residents often spend more time interacting with a computer than they do with their patients.

Further complicating the inpatient training of residents are the restrictions on duty hours that are now a mandatory component of residency program design. Although limiting the number of hours that residents can spend in the hospital undoubtedly has a number of benefits, it also presents a challenge for education and training [12, 13]. Typically, reductions in the number of hours a resident can work have exceeded reductions in their patient care workload, leading to a decrease in time available for educational activities. Whether this challenge will become even more acute in the future is currently unclear, as

there has been significant interest in further reducing the duty hour restrictions from 80 hours down to 56 or 60 hours per week (14).

Several *changes in the educational environment* are also now affecting the 21st century medical educator. For much of the latter part of the 20th century, medical training, particularly in the cognitive specialties, was largely based on a pathophysiologic approach. Although pathophysiology is still an important component of training, particularly for medical students, the coin of the realm is now the evidence basis for decision-making rather than the pathophysiologic basis. Educators currently need to know whether the information they impart, particularly about diagnostic and therapeutic plans, is backed by evidence, not just by sound scientific rationale. In addition, the traditional model of assessing students and residents for their medical knowledge and clinical skills has been supplemented by a focus on their acquisition of four additional competencies: professionalism, communication skills, systems-based practice, and practice-based learning and improvement. Finally, the educational environment has been transformed by technology, as the cornerstone of information dissemination and retrieval is no longer the printed page, but rather the computer and hand-held personal digital devices. Physicians and trainees expect sophisticated search capabilities leading to instant retrieval of focused information and real-time answers to clinical questions.

The final category of environmental factors includes several *pressures on faculty*. Financial constraints confronting academic institutions have led to a more rigorous accounting of faculty time and remuneration models that are based primarily on clinical and research productivity rather than on teaching contributions. Time pressures on faculty have led not only to reduced amounts of time that the practicing clinician can spend with each patient, but also to a decrease in the amount of discretionary, non-scheduled time that is available to teach students and residents. Finally, as students and residents are expected to acquire competencies that were not part of traditional medical education during the latter part of the 20th century (e.g., in systems-based practice and practice-based learning and improvement), faculty need the skills to train, supervise, and evaluate students and residents in these newer, non-traditional areas.

Approaching the 21st Century Environmental Issues

In response to the 10 environmental issues enumerated above, both systems and people need to react, and our educational approach needs to be modified. The system needs to provide appropriate rewards for teaching. These rewards come not only in the form of financial remuner-

ation, but also in the currency for academic advancement. Particularly in the clinical arena, it is important for schools to identify a cadre of faculty who are largely dedicated to training the next generation of physicians — a "core faculty" of clinician educators and educational leaders whose primary academic contribution is in the form of teaching and leadership of educational programs. However, the appropriate models for both academic and financial reward are still in evolution, and need to be refined so that educational contributions by faculty, and particularly by core faculty, are appropriately acknowledged.

Our philosophical approach to education also needs to change. Faculty are no longer omniscient professors who serve as the authoritative source of knowledge for their students. Rather, learning, particularly in the clinical setting, has become a "team sport." The unit of learning is often a group of individuals at different levels, including the faculty member and several varieties of trainees and students. Anyone on the team can (and should) serve as a source of knowledge and experience, not just the faculty member. The exchange of information, ideas, and critical analysis needs to flow in all directions, and everyone on the team potentially serves as both a learner and a teacher. The faculty member then often becomes more of a moderator of the learning experience as well as someone who provides evaluation and feedback to other members of the learning team.

As mentioned earlier, a relatively new entry to the educational milieu that has had an enormous impact on knowledge dissemination and acquisition is the digital information resource, whether in the form of a computer or a hand-held device such as a personal digital assistant (PDA). Everyone, whether in the traditional role of learner or teacher, now has a wealth of medical knowledge available, literally at his or her fingertips. Information and resources, either from the primary literature or from secondary sources that integrate and summarize knowledge, can be obtained within seconds on virtually any topic. We also need to recognize that the most durable form of learning often takes place at the point of care, and is driven by the immediate needs of the learner or the provider of patient care. At the same time, however, we acknowledge that, even though technology represents an extraordinary source of medical information, it cannot replace the experienced teacher's judgment or ability to obtain, process and synthesize clinical information from a patient. Therefore, our educational approaches must be designed to integrate technology most effectively with our traditional educational methods, and must take into account both the benefits and the limits of technology as a valuable educational tool.

The environmental issues and challenges that we have identified now require direct action by faculty who are involved in medical education. Rather than focusing on disseminating knowledge, clinical faculty must now prioritize a time-efficient supervision and oversight of data acquisition and analysis by trainees, including integration of case-related information. Faculty must understand how to evaluate and provide feedback to students and other trainees in more effective and ongoing ways than they have done in the past, focusing on those six general competencies that have been defined by the ACGME but often adopted at other levels, ranging from students to practicing physicians. Faculty must recognize their importance in modeling professional behavior, and must strive to be exemplary role models in all activities—whether in terms of clinical performance, interpersonal relationships and communication, or professionalism.

Finally, faculty must recognize the need to acquire new skills that are important for 21st century medical educators, but have not been part of the traditional portfolio for medical teaching faculty. These include an understanding of such topics as quality improvement, patient safety, evidence-based medicine, and medical ethics, just to name a few. Faculty development programs are critical to acquaint teaching faculty with these topics and to promote their incorporation into the culture and fabric of medical education.

In closing, I believe that the role of medical educator—training the next generation of physicians—is one of the most important and gratifying that a physician can assume. Although we are in a new environment for medical education in the 21st century and are therefore faced with new challenges, Osler's personal reflections about being a medical educator are still as valid today as they were when he made them approximately a century ago [15]: "I desire no other epitaph . . . than the statement that I taught medical students in the wards, as I regard this as by far the most useful and important work I have been called upon to do."

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DISCUSSION

Ludmerer, St. Louis: Thank you for your comments, Steve, and I think they juxtaposed very nicely with those of Larry's from the preceding presentation. In thinking of your talk, particularly in conjunction with Larry's, it seems to me that the challenge that medical schools have, whether new schools or old schools, is the same, and that is a moral one. The degree to which the school is willing to reward the teaching mission, as opposed to other important things that medical schools do, basically boils down to having money to promote and to reward people who are particularly effective at teaching. A few years ago, Washington University opened a new teaching and learning center, a magnificent accomplishment. I had an opportunity to speak there and pointed out that at that moment in time, Washington University Medical School had 124 endowed professorships, none of which was given to an individual for teaching excellence. These are value choices that medical schools have. Washington University has built a building at a rate of greater than one a year since I have been at that institution, and this is an institution I love. If one time the medical school would devote that effort to endowing the teaching mission, there would be an extraordinary endowment to support the medical educators that you are talking about, in the basic sciences as well as in the clinical fields, through chairs, half of a person's teaching time, and so forth. The good news, I would say to both old and new schools, is that we don't need a huge teaching faculty to do our job well. Our faculty size in the past generation or two has increased because of research and even more because of clinical care, not for the education of medical students. The number

of faculty that would need to be properly supported is relatively small in today's standards. So this, I think, is a ray of hope.

Weinberger, Philadelphia: I think you are absolutely right and I believe that the financial models actually need to change in a couple of ways. One is obviously more recognition from the medical schools for the support of medical education. There also needs to be a broader support of medical education from third party providers as well. As we know, graduate medical education support is provided by CMS without any support from other third party providers and insurers, and that needs to be incorporated as well.

Southwick, Gainesville: Steve, that was really excellent! One of the problems that we encounter, and I think this is true at all academic centers, is the problem of multi-tasking. Everyone is asked to do everything every day, and I would propose that people begin to look at business models, in particular by developing very careful definitions of what people should do when; I have been applying these systems on my own work rounds. I have defined a specific time for teaching. I define specific times for attention to each individual patient, and in that way we have dramatically shortened the time of rounds, improved the time for teaching, improved the quality of what we provide, and actually begun to attack many of the deficits in our systems. So I think that systems are a way we can get at this without more cost.

Weinberger, Philadelphia: Thank you, Fred. I think that's absolutely right, and I would add just one brief comment. I believe that the particular challenge is in the ambulatory environment, where we really need to develop teaching models for ambulatory practices; I could spent a lot of time on that, but I think that's an important challenge.

Kitchens, Gainesville: Speaking of third party payers, I try to carve out three hours a day for teaching on the inpatient hemostasis consult service which I have in Gainesville. Now I've clocked about two hours and 30 minutes writing meaningless stuff in charts that has already been written better by a fellow than I can write. The reason I have to write the same thing again is in order to bill. If I could sit down and teach for that two and a half hours and sign for a much shorter period of time, it would be an awful lot better. For instance, an aortic patch was leaking on a 25-year-old kid, and they thought there had something wrong with his blood. I had to look at them and say, "This kid's got Ehlers-Danlos syndrome. There isn't anything wrong with his blood," and I would like to talk, at that moment, to the pediatrician standing there and the internal medicine resident standing there, just to go through the process, but I have to write this long note. We'll catch up with it later! We will do it later! We will catch up later! It never happens!

Weinberger, Philadelphia: Well, you gave a very good summary of what I described as time pressures for the faculty.